

SIT323/SIT737- Cloud Native Application Development

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10.1P: Monitoring and Visibility

GitHub Link: <https://github.com/AndyWanng/sit323-hd-project.git>

Deployment Guide for Kubernetes Cluster: Task Calculator

Application

Introduction

This Kubernetes configuration encompasses the deployment of a multi-component application which includes a frontend server, an authentication server, a calculator server, and a MongoDB database. This setup ensures that all components are deployed in a secure and scalable fashion within a Kubernetes environment.

Components Overview

1. Secrets:

- **mongo-secret:** Stores MongoDB credentials for database access.

2. Deployments:

- **user-service-deployment:** Handles user related services such as authentication
- **journal-service-deployment:** Handles journal related services such as adding and retrieving,
- **schedule-service-deployment:** Handles schedule related services such as adding and retrieving,
- **frontend-service-deployment:** Serves the user interface.
- **mongo:** MongoDB database deployment for data storage.

3. Services:

- Expose application components within the Kubernetes cluster.

4. Persistent Volumes:

- Ensure data persistence for MongoDB with a PersistentVolumeClaim.

5. Ingress:

- Routes external traffic to the services based on configured paths.

Deployment Guide

Prerequisites:

- A Kubernetes cluster is up and running.
- kubectl is configured to interact with your cluster.
- Docker images for the application components are available in a registry.

Deployment Steps:

1. Prepare Your Configuration Files:

- Ensure all your Kubernetes YAML configurations are stored in one directory. This typically includes your deployments, services, secrets, persistent volume claims, and ingress configurations.

2. Deploy the Entire Configuration:

- Navigate to the directory where your Kubernetes configuration files are located.
- Use the following command to apply all configurations at once:

```
kubectl apply -f .
```

3. Check Deployment Status:

- Verify that all pods are running correctly:
kubectl get pods
- Check the status of your services to ensure they are properly set up:
kubectl get services
- Inspect the stateful sets, particularly for MongoDB:
kubectl get statefulsets

4. Monitor Resource Usage and Logs:

- Monitor the resource usage:
kubectl top pod
- Tail the logs of a specific pod if needed:

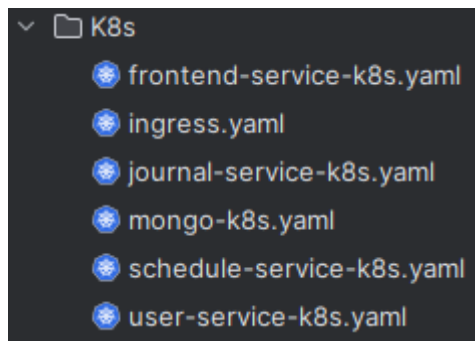
kubectl logs -f <pod-name>

5. Access the Application:

- If using an ingress controller, access your application via the URLs configured in the ingress rules.
- Otherwise, you might need to use port-forwarding or external IPs based on your service configurations to access your application.

Screenshots:

K8s files:



Pods, services, deployments and statefulsets monitoring:

```
PS C:\Users\22396\WebstormProjects\sit-323-HD-task\k8s> kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/frontend-service-75c457455c-qsttt	1/1	Running	0	64m
pod/journal-service-5778f59cdc-xx68z	1/1	Running	0	64m
pod/mongodb-0	1/1	Running	0	64m
pod/schedule-service-6cdcc69b7b-k6kzk	1/1	Running	0	64m
pod/user-service-5889cbc548-z5fcr	1/1	Running	0	64m

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/frontend-service	ClusterIP	34.118.232.28	<none>	8080/TCP	64m
service/journal-service	ClusterIP	34.118.235.139	<none>	8082/TCP	64m
service/kubernetes	ClusterIP	34.118.224.1	<none>	443/TCP	69m
service/mongodb	ClusterIP	None	<none>	27017/TCP	64m
service/schedule-service	ClusterIP	34.118.234.163	<none>	8083/TCP	64m
service/user-service	ClusterIP	34.118.234.94	<none>	8081/TCP	64m

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/frontend-service	1/1	1	1	64m
deployment.apps/journal-service	1/1	1	1	64m
deployment.apps/schedule-service	1/1	1	1	64m
deployment.apps/user-service	1/1	1	1	64m

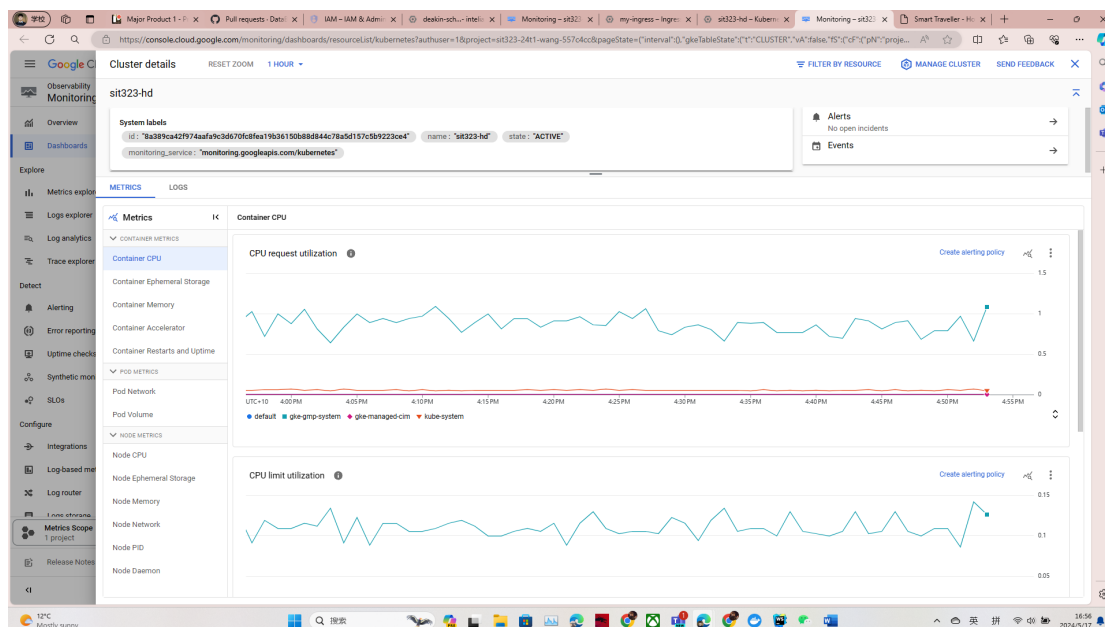
NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/frontend-service-75c457455c	1	1	1	64m
replicaset.apps/journal-service-5778f59cdc	1	1	1	64m
replicaset.apps/schedule-service-6cdcc69b7b	1	1	1	64m
replicaset.apps/user-service-5889cbc548	1	1	1	64m

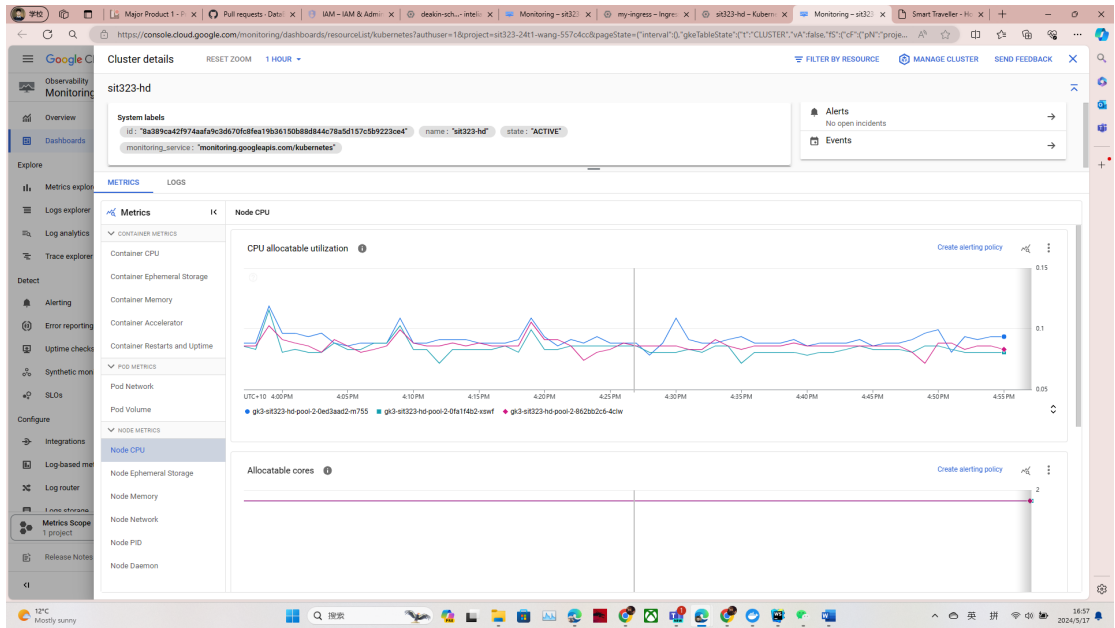
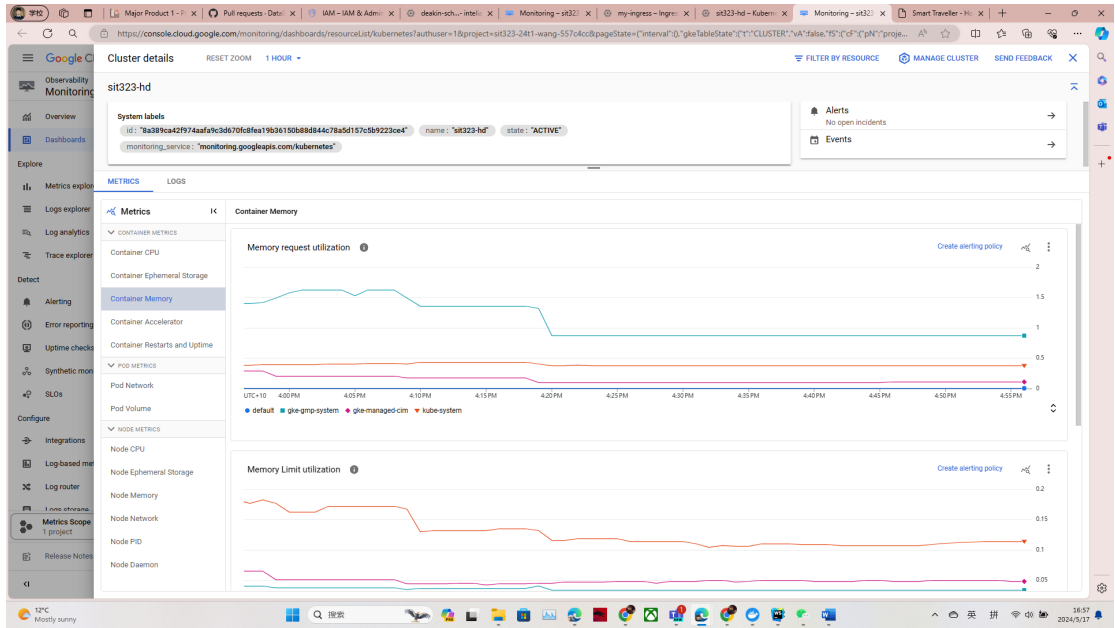
NAME	READY	AGE
statefulset.apps/mongodb	1/1	64m

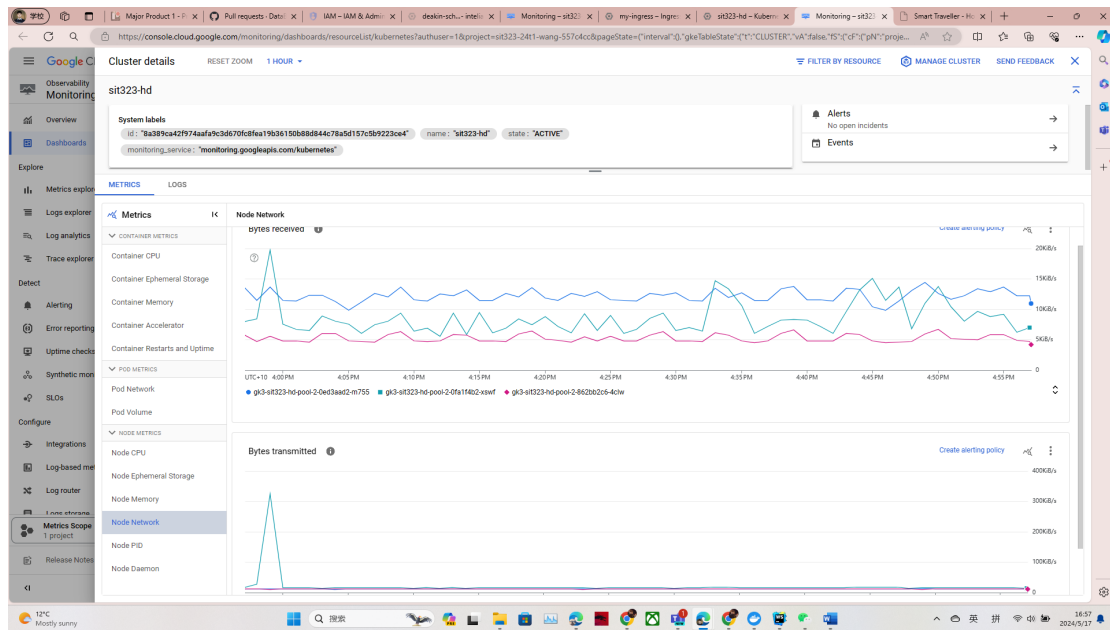
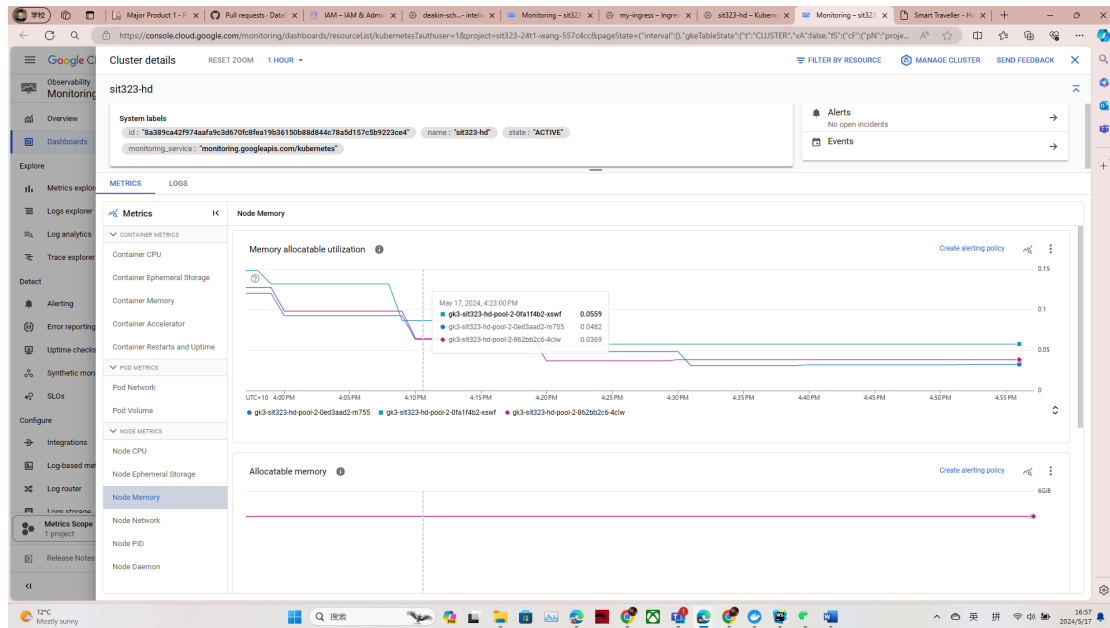
```
PS C:\Users\22396\WebstormProjects\sit-323-HD-task\k8s>
```

Monitoring the cluster through the dashboard:

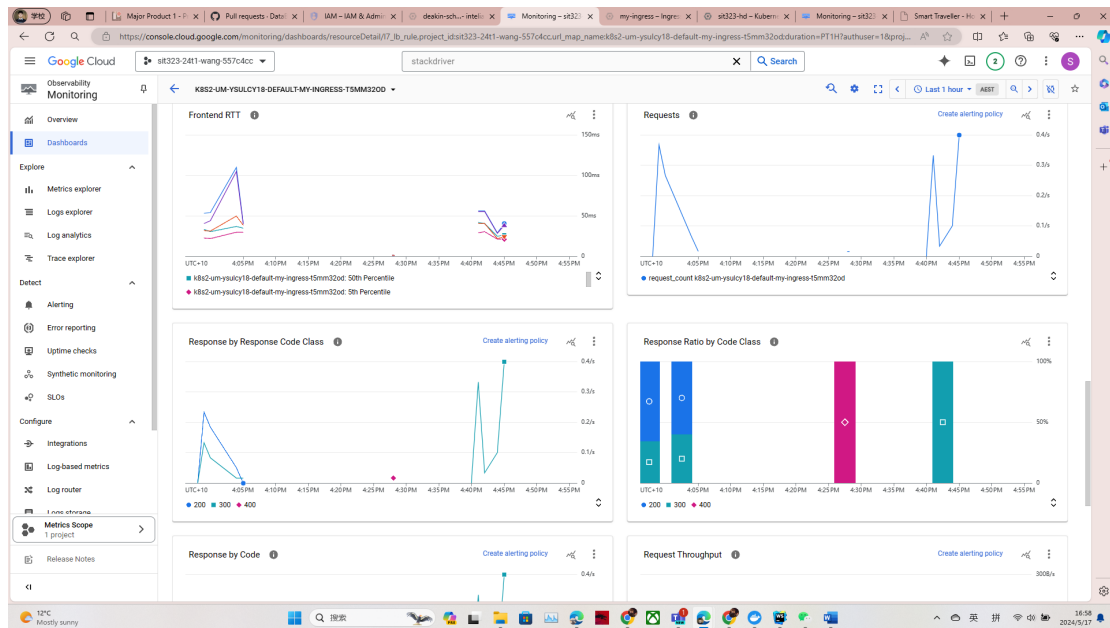
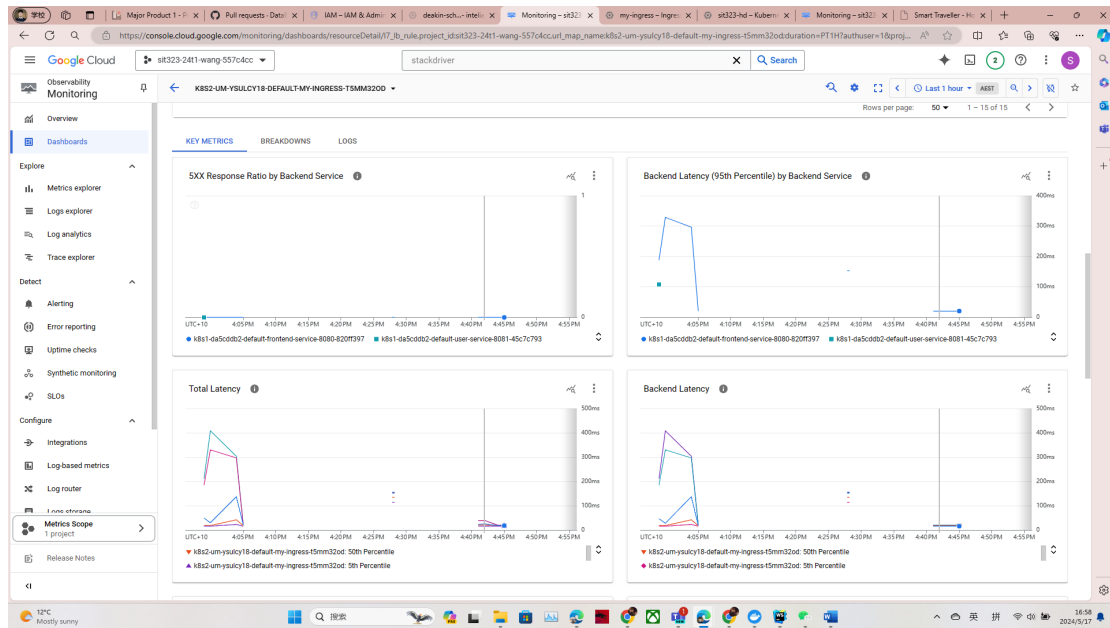
Cluster related:





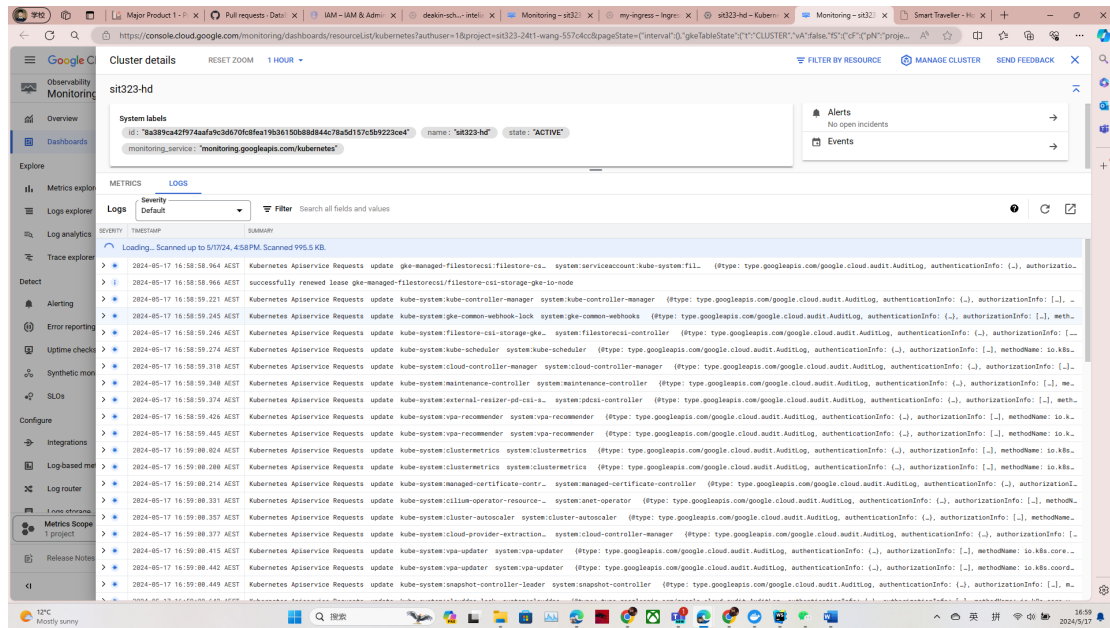


Load-balancer related:

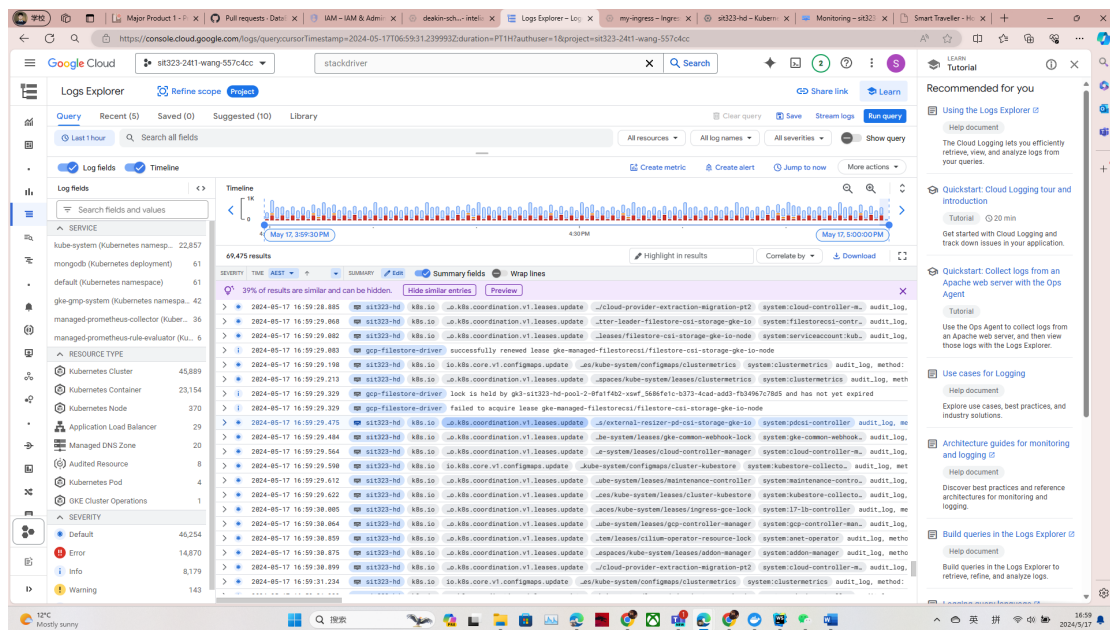


Logging through the dashboard:

Cluster related:



Load-balancer related:



Web pages:

